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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/597,031	07/07/2006	Michalakos Averkiou	US040076US2	8972
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EXAMINER HUNTLEY, DANIEL CARROLL				
ART UNIT		PAPER NUMBER		
3737				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/597,031

Applicant(s)

AVERKIOU ET AL.

Examiner

DANIEL HUNTLEY

Art Unit

3737

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 February 2009 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/GS/US)
- Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

The drawings are objected to because the boxes in figures 1, 2, and 5 lack a text description. Reference numerals alone are insufficient. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claims 5-11 are objected to because of the following informalities: Claims 5 and 8-11 fail to set forth an active step in the method. Appropriate correction is required.

Claims 12 and 14 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to

cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The examiner interprets claim 12 to depend from claim 1 as written, which means that the apparatus claim 12 fails to further limit the method claim 1. Concerning claim 14, applicant should change "The device of claim 14" to "The device of claim 13".

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In re Claims 1-12 and 15, the preamble refers to contrast agents, however, the body of the claim fails to set forth the introduction of any contrast agents.

Claim 1 recites the limitation "the chamber" in line 4. There is insufficient antecedent basis for this limitation in the claim.

In re claim 11, it is unclear as to whether 'wherein the first set' refers to just chamber blood as described in claim 2 above, or both chamber blood and myocardial tissue blood.

In re claim 12, it is unclear as to whether claim 12 is intended to depend from claim 1.

In re claim 14, it is unclear as to which claim it depends.

Claim 15 recites the limitation "the chamber" in lines 4-5. There is insufficient antecedent basis for this limitation in the claim.

Claims 13 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: a contrast agent.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-4, 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Publication 2002/0065467 A1 (Schutt('467)) in view of US Publication 2001/0056236 A1 (Angelsen('236)).

In re claims 1-4 and 12-15, in the field of vascular fluid monitoring systems, Schutt('467) teach a system and method for transmitting ultrasound pulses into a patient and receiving echoes

which correspond to blood in myocardial tissue as well as blood in the chamber of the heart ([0195]-[0196]) and a processor adapted to convert the ultrasound echoes into image data ([0054]-[0058]; [0207]). It is noted that while Schutt('467) teach a measurement containing only chamber blood flow data and also a measurement containing total blood flow, Schutt('467) fail to expressly teach removing chamber flow data from tissue flow data. However, in the field of blood perfusion measurement methods, Angelsen('236) teach a processing unit for suppressing heart cavity blood flow when imaging myocardial tissue ([0070]). The examiner interprets heart cavity to be an alternate description of heart chamber. Hence, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the fluid monitoring system as disclosed by Schutt('467) with the suppression of heart cavity blood flow as disclosed by Angelsen('236) in order to enhance the contrast agent signal and image data of the myocardium by eliminating interfering higher velocity flow data from the heart cavity (Angelsen('236) – [0070]).

Claims 5-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schutt('467) and Angelsen('236) as applied to claim 4 above, and further in view of Simpson, D.H. et al, Pulse Inversion Doppler: A New Method for Detecting Nonlinear Echoes from Microbubble Contrast Agents, IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, vol 46, no. 2, March 1999.

In re claims 5-11, Schutt('467) and Angelsen('236) teach the invention as described above and, further, Schutt('467) teach harmonic gray scale image data methods ([0156]) as well as color Doppler ([0135]). Color Write priority and Multiple pulse Doppler signals are well

known techniques in the art and would be an obvious design choice in the absence of any further showing of criticality or unexpected result. It is noted that neither Schutt('467) nor Angelsen('236) teach pulse inversion or power modulation methods. However, in the field of nonlinear Doppler ultrasound using contrast agents, Simpson, D. H., et al teach a pulse inversion Doppler method as an alternative to conventional Doppler imaging (abstract).

Hence, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the fluid monitoring system as disclosed by Schutt('467) and the suppression of heart cavity blood flow as disclosed by Angelsen('236) with the method of pulse inversion Doppler as disclosed by Simpson, D.H. et al, in order to improve spatial resolution in the Doppler image when employing contrast agents (Simpson, D.H. et al - abstract).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL HUNTLEY whose telephone number is (571)270-1217. The examiner can normally be reached on Monday through Friday, 7:30-4, alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ruth S. Smith/
Primary Examiner, Art Unit 3737

/DANIEL HUNTLEY/
Examiner, Art Unit 3737